

Work Order ID 79116

January-20-12 10:29:58 AM

79116

U/R

Page 1

Item ID: D212-664-107

Revision ID: ~~UR~~ N/A *R*

Item Name: Crosstube Low Standard Fwd

Start Date: 20/01/2012 Start Qty: 1.00

Accept

N900040100

Setup

Start

NS1

Required Date: 07/02/2012 Req'd Qty: 1.00

1

Cust Item ID:

1

Customer:

Reference:

Approvals: Process Plan: *MLJ*

Date: 12/01/20 Tooling:

Date:

Run

Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr	Revision Nbr
D212-664-147	Rev B (DEO)

100
100

DC

Document Control

DOCUMENT CONTROL *SD*

100
100

Memo

0.00

MLJ 12/02/29

Photocopy bluefile and create labels as per PPP D212-664-107
D6019-128 (ID = 2.125") = CHG 002
D6005-128 (ID = 2.000") = CHG 003

S 12/03/01

@ CHG 003

110

110

Packaging

Packaging

Memo

0.00

MLJ 12/2/9

Packaging

120

120

CNC Bend 2

CNC Alpha 160 Bender

BENDING MACHINE - CROSSTUBES

Memo

0.00

Bend tube as per Dwg D212-664-107 using CNC bender program 212-107

MLJ 12/2/9

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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NOTE: Date & initial all entries

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Item ID: D212-664-107

Accept

N900040100

Setup Start

NS1

Revision ID: U/R

Item Name: Crosstube Low Standard Fwd

Stop

NS2

Start Date: 20/01/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 07/02/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____

Date: _____

Tooling: _____

Date: _____

Run Start

NR1

QC: _____

Date: _____

SPC (Y/N): _____

Date: _____

Stop

NR2

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

130

QC15- Crosstube Dimensional Check

0.00

12/02/09

130

QC

Quality Control

140

Crosstubes

0.00

140

Crosstubes

Memo

0.00

1-Cut tube as per inspection dwg and deburr ends. ***ensure saw is square***

2-Position cuffs on tube ensure proper positioning

3-Drill tube as per dwg using DT8577 location #7 & # 212 ULF using jig DT8548 and DT8549 as per QSI 10

4-Transfer drill rivet holes from cuff into tube.

5-Identify cuff position and Batch # on each and identify tube as per dwg D212-664-107.

6- Inspect surface damage

7- Deburr and realodine cuff.

JW
Mo

12-2-10

RM
Mo

12/2/10

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	QC:	Date:	SPC (Y/N):	Date:	Stop		*NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
150 *150* HandFXtube	Crosstubes Chemical Conversion Hand Finishing Crosstubes	0.00							
	Memo								
160 *160* QC	QC3- Inspect Part Finish Quality Control	0.00							
	Memo								
170 *170* QC	QC5- Inspect part completeness to step on W/O Quality Control	0.00							
	Memo								

By Mo

12-2-10

S.2015

S.2015

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Approvals:	Process Plan:	Date:	Tooling:	Date:	Run	Start	*NR1*
	QC:	Date:	SPC (Y/N):	Date:	Stop		*NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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180 Outsource process - NDT per QSI038 4.1 0.00

180

Outsource2

Memo 0.00

Outsource process - NDT
Liquid Penetrant Inspection as per QSI 038Or
Issue P/O: 16223 LPI as per ASTM 1417
Level 2 Attach copy of NDT results to work order

CL 12/02/12 ①

190 0.00

190 Packaging

Memo 0.00

Packaging
Ensure copy of NDT results attached to work order.

CL 12/02/12 ①

200 QC5- Inspect part completeness to step on W/O 0.00

200 QC

Memo 0.00

Quality Control
Inspect for damage & ensure results are as per Dwg D212-664-107

CL 12/02/12

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Approvals:	Process Plan:	Date:	Tooling:	Date:	Run	Start	*NR1*
	QC:	Date:	SPC (Y/N):	Date:	Stop		*NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
210 *210* Crosstubes	Crosstubes	0.00							
	Memo	0.00							
Crosstubes	1-Rivet Cuffs as per Dwg D212-664-147, with Sika flex in Between tube & Cuff A/R SIKAFLEX -241/-291 BATCH: <u>119999</u>								

215 *215* QC Quality Control	QC5- Inspect part completeness to step on W/O	0.00							
	Memo	0.00							

Al 12-2-23

Al 12-02-23 0

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Customer:

Reference:

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	QC:	Date:	SPC (Y/N):	Date:	Stop		*NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
220	SprayPaint	0.00							
220	Memo	0.00							
SprayPaint	1-Prime inside and outside crosstube as per QSI 005 4.2								
Spray Painting	2-Paint outside crosstube with White Intron as per QSI 005 4.2								

PRIME:
Start Time: 10:15
Finish Time: 11:00

PAINT:
Start Time: 3:30
Finish Time: 4:15

230

QC14- Inspect Spray Paint 0.00

230

QC

Quality Control

Memo 0.00
Wrap in plastic bag to protect from scratches

11 - 02 - 24 (1)

W/O:		WORK ORDER CHANGES					
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Required Date: 07/02/2012 Req'd Qty: 1.00 *1*

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Reference:

Approvals:	Process Plan:	Date:	Tooling:	Date:	Run	Start	*NR1*
						Stop	
	QC:	Date:	SPC (Y/N):	Date:			*NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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240

240

Crosstubes

Crosstubes

0.00

AB 12 - 2-24

Memo

0.00

1- Assemble as per Dwg D212-664-147

1-Abrade mating surfaces of support and crosstube with 400 grit sandpaper,
clean the area with 4105S wash 'n' wipe

2-Install supports with Proseal 890 per DSI9563 and QSI 015
A/R Proseal 890 Batch: 120072

3- Torque bolts as per dwg

250

QC5- Inspect part completeness to step on W/O

0.00

5120072

250

QC

Quality Control

Memo

0.00

AB

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79116

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Stop

NS2

Start Date: 20/01/2012 Start Qty: 1.00 *1*

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Required Date: 07/02/2012 Req'd Qty: 1.00 *1*

Customer:

Reference:

Approvals:	Process Plan:	Date:	Tooling:	Date:	Run	Start	*NR1*
	QC:	Date:	SPC (Y/N):	Date:	Stop		*NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
280 *280* QC Quality Control	QC21- Final Inspection - Work Order Release Memo	0.00 0.00						MLJ 12-03-101	MLJ 12-03-101

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- Picklist Print

January-20-12 10:30:02 AM

Page 1

Work Order ID: 79116

79116
D212-664-107

Parent Item: D212-664-107

Parent Item Name: Crosstube Low Standard Fwd

Start Date: 20/01/2012

Required Date: 07/02/2012

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:A New Issue 07.09.12 EC verified by: JLM
IPP Rev:B ECN 1100 08-01-11 DD verified by: EC
IPP Rev:C Een 1121 08-02-25 DD Verified by:ec IPP Rev:D
10.05.27 added pick kit DD verf:EC IPP Rev:E 11.10.17
added SEQ 215 DD verf:EC IPP REV:F 11.11.03 as per
chg003 DD verf:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D212-664-107TRN		Manufactured	No			140	Each	4.0000	1	1			**

D212-664-107TRN

Crosstube Turning Detail

D6005-126

Location	Loc Qty	Loc Code
LG	4	
76248	1	
76249	1	
77227	1	
77228	1	

D3659-1

Manufactured No

220 Each 6.0000

**

1 MO 12/2/9

D3659-1

CUFF

Location	Loc Qty	Loc Code
ST482	6	
67005	1	
75173	5	

CR3212-4-06

Purchased No

240 Each 374.0000 44

**

2 MO 12/2/9

CR3212-4-06

CHERRY RIVET

AB 12-2-23

Location	Loc Qty	Loc Code
ST331	374	
112492	18	
112794	8	
119717	248	
120187	100	

44

W/O:		WORK ORDER CHANGES					
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D212-664-107

Parent Item: D212-664-107

Parent Item Name: Crosstube Low Standard Fwd

Start Date: 20/01/2012

Required Date: 07/02/2012

Start Qty: 1.00

Required Qty: 1.00

D3595-063-450

Manufactured No

240

Each

34.1095

4

4

**

AD 12-2-24

D3595-063-450

RUBBER CUSHION

Location	Loc Qty	Loc Code
MAT052 77678	34.109474	4
67353	2	
68893	6	
70113	0.56	
71354	0.2	
74113	0.349474	
75597	25	

MS21920-25

Purchased No

240

Each

36.0000

4

4

**

AD 12-2-24

MS21920-25

Clamp(per MIL-DTL-8783C)

Location	Loc Qty	Loc Code
LG050	36	
116264	2	
117998	4	
118142	4	
119339	2	
119746	2	
(120054)	22	

D2893-1

Manufactured No

240

Each

5.0000

2

2

**

AD 12-2-24

D2893-1

2.75 Support

Location	Loc Qty	Loc Code
LG	2	
77606	2	
LG052 78561	3	2
72865	2	
76250	1	

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Parent Item Name: Crosstube Low Standard Fwd

Start Date: 20/01/2012

Required Date: 07/02/2012

Start Qty: 1.00

Required Qty: 1.00

D3428-1

Manufactured No 260 Each 5.0000

1
**

D3428-1

Placard

SP

SP

AN6-35A

Purchased No 260 Each 88.0000

4
**

AN6-35A

BOLT

SP

SP

AN6-36A

Purchased No 260 Each 50.0000

4
**

AN6-36A

Bolt

SP

SP

MS21042L6

Purchased No 260 Each 1,214.0000

6
**

MS21042L6

Nut

SP

SP

Location	Loc Qty	Loc Code
ST342	50	
118422	2	
119449	1	
120187	47	
ST300	1214	
117677	25	
118384	3	
118927	48	
119075	938	
120308	200	

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Start Date: 20/01/2012

Required Date: 07/02/2012

Start Qty: 1.00

Required Qty: 1.00

AN960JD616

NAS1149D0663J Purchased

No

260

Each

0.0000

18

18

**

1119075

12/3/11

✓

AN960JD616
Washer

SP

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng/ Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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DART AEROSPACE LTD	Work Order:	79116
Description: Crosstube Low Fwd (205/212/412)	Part Number:	D212-664-107
Inspection Dwg: D212-664-147	Rev: B	Page 1 of 1

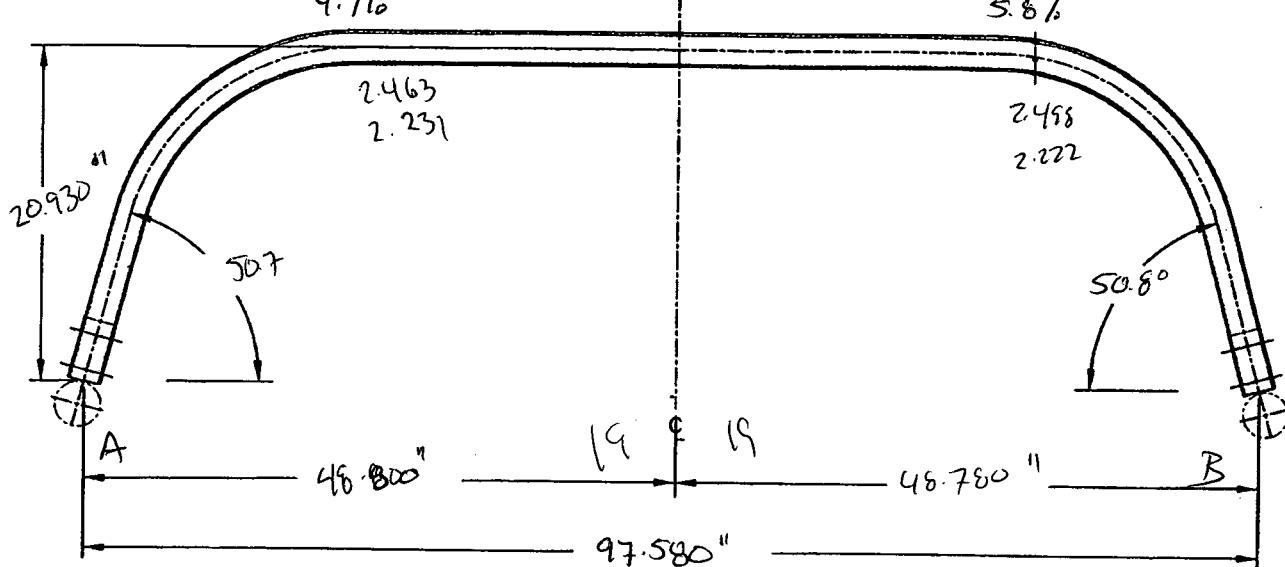
Required Dimension	Min	Max
Height	20.79	21.05
1/2 Span	48.55	48.81
Angle	49	52
Total Span	97.1	97.62

$232 \div 4.694$

4.976

$276 \div 4.720$

5.87



Comments
Size A = 4.976 crushing <input checked="" type="checkbox"/> 15 Passes
Size B = 5.876 crushing <input checked="" type="checkbox"/> 15 Passes

QC15 Inspection

Date

17/02/09

Rev	Date	Change	Revised by	Approved
A	08.02.29	New Issue	KJ/JM	
B	10.01.21	Dwg Rev updated	KJ	

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B

Item	Qty	Qty	Part Number	Description
	-147	-147B		
1	X		D212-664-147	CROSSTUBE ASSEMBLY (205/212/412 LOW FWD)
2	X		D212-664-147B	CROSSTUBE ASSEMBLY (214 LOW FWD)
3	1	1	D6019-128	CROSSTUBE
4	2	2	D2893-1	SUPPORT
5	4	4	D3595-063-450	RUBBER CUSHION
6	2	2	D3659-1	CUFF
7	4	4	MS21920-25	CLAMP (OR MS21920-26)
8	44	44	CR3212-4-06	RIVET (OR M7885/3-4-06)
9	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
10	A/R	A/R	SIKAFLEX-241/-291	SEALANT (OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT)

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6019-128
FINISHED LENGTH = 126.528±0.020 (BEFORE BENDING/TRIMMING)
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: D212-664-147 = 24.2 lbs (PER IIN-D212-664)
D212-664-147B = 24.2 lbs (PER IIN-D212-664)
- 8) PART IS SYMMETRIC ABOUT CENTERLINE
- 9) WHEN MACHINING TAPER, RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D. EXCEPT UP TO 10% IS ALLOWED IN AREA NOTED.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2893-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2893-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-25 CLAMPS (OR -26) WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE D2893-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED OUT AFTER TORQUING.
- 16) INSTALL D3659-1 CUFF AFTER CHEMICAL CONVERSION COAT BUT BEFORE PAINT, WITH A LAYER OF SIKAFLEX-241/-291 OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT BETWEEN CUFF AND CROSSTUBE. SEAL EDGE OF CUFF TO ENSURE NO GAPS.
- 17) TOUCH-UP HOLES WITH CHEMICAL CONVERSION COAT.

SHOP COPY

REF ID: TO

ENCLOSURE

UNCONTROLLED COPY

SUBJECT TO AMENDMENT

WITHOUT NOTICE

WORK ORDER

NO. 79-116 M.C.J

12/01/20

DEO ATTACHED

See EGNT II.G.14
11/09/28
UNDER REVIEW
9/11/13RELEASED
2009-10-29
MF

B	REVISE GENERAL NOTES/PART LIST; UPDATE TO CURRENT STANDARDS: ADD -147B (ZN C4-2, D4-2)	RF	09.09.30
A	NEW ISSUE	CP	07.07.07
REV.	DESCRIPTION	BY	DATE
DESIGN	99	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	99	DRAWING NO.	REV. B
MFG. APPR.	11	D212-664-147	SHEET 1 OF 4
APPROVED	10	TITLE	SCALE
DE APPR.	11	CROSSTUBE (205/212/412 LOW FWD)	NTS
DATE	09.09.30	COPYRIGHT © 2007 BY DART AEROSPACE LTD THIS DOCUMENT IS THE PROPERTY OF DART AEROSPACE LTD. IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

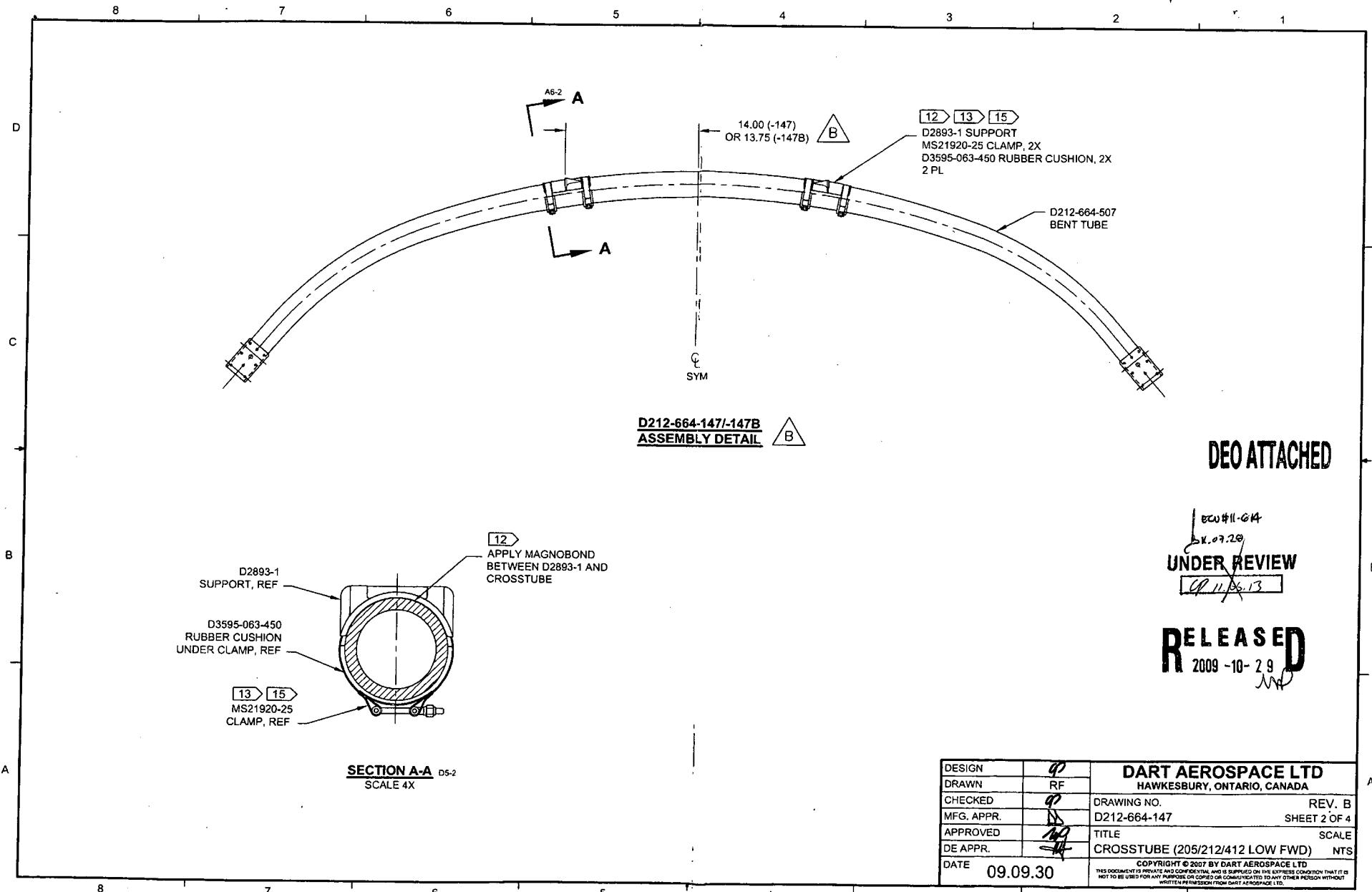
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

79116



W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

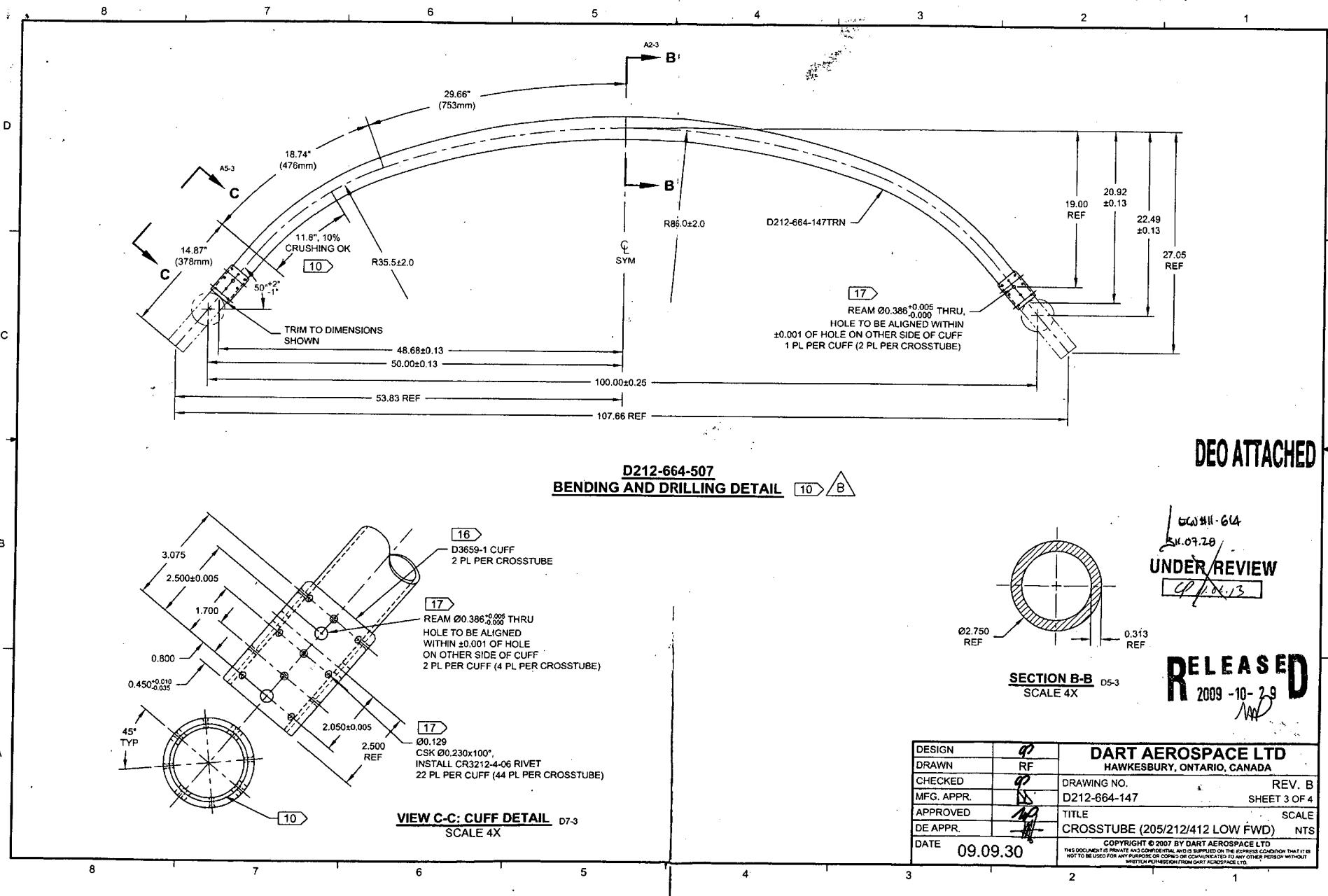
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

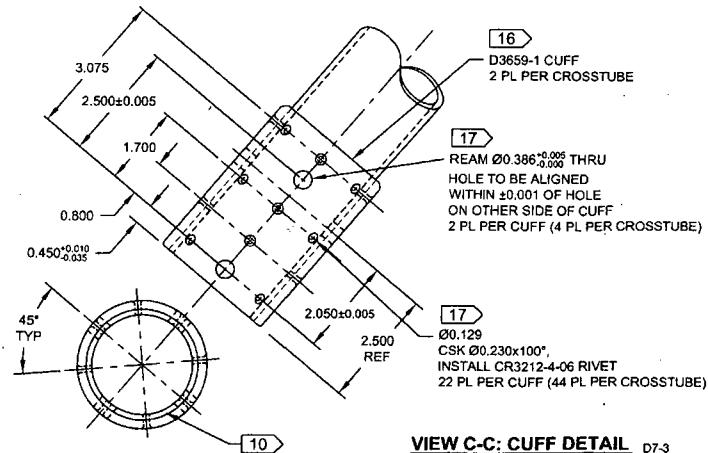
NOTE: Date & initial all entries

79116

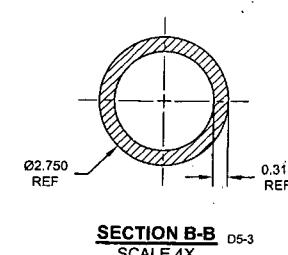


DEO ATTACHED

D212-664-507
BENDING AND DRILLING DETAIL



VIEW C-C: CUFF DETAIL D7-3



SECTION B-B D5-
SCALE 4X

RELEASED
2009-10-29

600#11-614
5K.07.28
~~UNDER REVIEW~~
~~9P.1.06.13~~

DESIGN	99	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	99	DRAWING NO.	REV. B
MFG. APPR.	DS	D212-664-147	SHEET 3 OF 4
APPROVED	109	TITLE	SCALE
DE APPR.	109	CROSSTUBE (205/212/412 LOW FWD) NTS	
DATE	09.09.30	COPYRIGHT © 2007 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

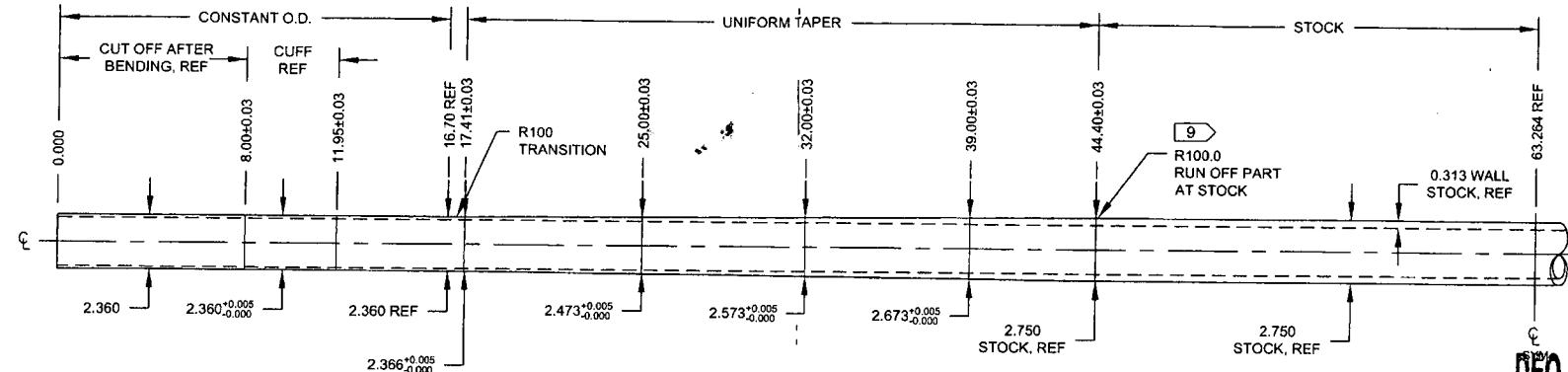
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

79116



D212-664-147TRN
TURNING DETAIL

ECO #1-614
11.07.26

UNDER REVIEW
11/14/06/13

RELEASED
2009-10-29
JP

DESIGN	<i>JP</i>	DART AEROSPACE LTD
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA
CHECKED	<i>JP</i>	REV. B
MFG. APPR.	<i>JP</i>	DRAWING NO. D212-664-147 SHEET 4 OF 4
APPROVED	<i>JP</i>	TITLE CROSSTUBE (205/212/412 LOW FWD) NTS
DE APPR.	<i>JP</i>	SCALE
DATE	09.09.30	COPYRIGHT © 2007 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OTHER THAN FOR WHICH IT WAS PROVIDED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

99116

DRAWING NO. D212-664-147	TITLE CROSSTUBE ASS'Y (205 LOW FWD)	REV. B	DART AEROSPACE LTD ENGINEERING ORDER	D.E.O. NO. D212-664-147-B-1	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>DP</i>	CHECKED <i>ASS</i>		MFG. APPR. <i>PS</i>	APPROVED <i>WJ</i>	DE APPR. <i>WJ</i>	
DATE 11.07.15	DATE 11.07.20		DATE 11.07.21	DATE 11.07.21	DATE 11.07.21	

PURPOSE:

REPLACE MAGNOBOND WITH PROSEAL.

CHANGE:

IS:

Item	Qty -147	Qty -147B	Part Number	Description
9	A/R	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

WAS:

9	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
---	-----	-----	----------------	---------------------------------------------------------------------------------------------------------------

NOTE 12 & 15, SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 12) TO INSTALL D2893-1 SUPPORT: ABRADE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

WAS:

- 12) INSTALL D2893-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2893-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

RELEASED
2011-07-29
WJ

W/O:

WORK ORDER CHANGES

DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action - Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

5.2 STANDARD GEAR CROSSTUBES

Item	-107	-207	-209	Part Number	Description
	X			D212-664-107	CROSSTUBE INSTALLATION, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K STANDARD FWD
		X		D212-664-207	CROSSTUBE INSTALLATION, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K STANDARD AFT
			X	D412-664-209	CROSSTUBE INSTALLATION, 412 STANDARD AFT
6	1			D212-664-147	CROSSTUBE ASSEMBLY, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K STANDARD FWD
7		1		D212-664-247	CROSSTUBE ASSEMBLY, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K STANDARD AFT
8			1	D412-664-249	CROSSTUBE ASSEMBLY, 412 STANDARD AFT
10	2			* D2893-1	SUPPORT
11	4			* D3595-063-450	RUBBER CUSHION
12	4			* MS21920-25	CLAMP (OR MS21042-26)
13	4			AN6-35A	BOLT
14	/ 4			AN6-36A	BOLT
15	6			MS21042L6	NUT (OR MS21042-6)
16	/ 18			AN960JD616	WASHER
20	2			* D2940-1	SUPPORT
21	4			* D3595-063-530	RUBBER CUSHION
22	4			* MS21920-28	CLAMP (OR MS21042-30)
23	4			AN6-40A	BOLT
24	2			AN6-41A	BOLT
25	6			MS21042L6	NUT (OR MS21042-6)
26	18			AN960JD616	WASHER
30		1		* D2896-1	SUPPORT
32		2		* D3595-063-570	RUBBER CUSHION
33		4		* MS21920-28	CLAMP
34		2		* MS21920-30	CLAMP (OR MS21042-32)
35		4		AN6-40A	BOLT
36		2		AN6-41A	BOLT
37		6		MS21042L6	NUT (OR MS21042-6)
38		18		AN960JD616	WASHER
39		2		* D3189-1	CHAFING SHIELD
45	2			* D3659-1	CUFF
46		2	2	* D3660-1	CUFF
47	44	44		* CR3212-4-06	RIVET (M7885/3-4-06)
48			44	* CR3212-4-07	RIVET (M7885/3-4-07)
50	/ 1	1		D3428-1	PLACARD

*REFERENCE ONLY. PARTS ARE INCLUDED IN D212-664-147/-247 OR D412-664-249 ASSEMBLIES ABOVE
 NOTE: KITS INCLUDE EXTRA HARDWARE FOR COMPATIBILITY WITH BOTH DART AND BELL/AAI
 SKIDTUBES.

Change Record

Part Number D212-664-107

Part Number 357C-004-10
Description CROSSPIPE LOW FWD (204/205/212)

Page 1 of 1



ACUREN

RAPPORT D'INSPECTION PAR RESSUAGE

P- 12178

PAGE 1 DE 1

CLIENT DART AEROSPACE DATE 2012-02-17
 ATTENTION Chantel HEURE 8 AM PM
 ADRESSE 1270 ABERDEEN ST. N° TRAVAIL 188-12-C0043
HAWKES BURY, ONTARIO N° CLIENT PO/WO 30551
 SITE DE TRAVAIL HAWKES BURY
 PROJET ASTM E1417-05 DATE/RÉV. NO indication
 ITEM(S) EXAMINÉ SEE BELOW ACCEPTATION STD.

DESCRIPTION DES TRAVAUX N° PROCÉDURE F0001 DATE/RÉV. 2009 N° TECHNIQUE LT-X XXX XX DATE/RÉV. 2009
 N° ITEMS SEE BELOW MATERIEL ALUMINIUM ÉPAISSEUR VARIABLE
 DESCRIPTION FPT ON X-TUBES AND RAPPEL

DÉTAILS DES INSPECTIONS

MÉTHODE : <input checked="" type="checkbox"/> FLUORESCENT	<input type="checkbox"/> VISIBLE	<input checked="" type="checkbox"/> LAVABLE À L'EAU	<input type="checkbox"/> MÉTHODE DISSOLVANT	<input type="checkbox"/> PRÉ-ÉMULSIONNANT
MARQUE : <u>MAGNAFLIX</u>		LUM. NOIRE S/N <u>26529</u>	<input checked="" type="checkbox"/> PUISS. > 1 000 μ W/cm ²	<input checked="" type="checkbox"/> AMBIANT < 2 fc
PÉNÉTRANT : <u>ZL67</u>	TEMPS PÉNÉTRATION MIN. <u>10</u>	<u>30</u> MIN.	ÉQUIP. LUMIÈRE <input checked="" type="checkbox"/> LAMP.POCHÉ	<input type="checkbox"/> LAMP.CULASSE
DISSOLVANT PÉNÉTRANT	TEMPS SÉCHAGE MIN. <u>>10</u>	MIN.	AUTRES	<input checked="" type="checkbox"/> PUISS.>100 fc @ SURFACE
RÉVÉLATEUR	TEMPS RÉVÉLATION MIN. <u>10</u>	MIN.	MÉTRE LUM. N/S	DATE CAL DUE <u>2012-12-07</u>
TYPE RÉVÉLATEUR	<input type="checkbox"/> NON AQUEUX	<input type="checkbox"/> AQUEUX	<input type="checkbox"/> SEC	

SURFACE INSPECTÉE

CONDITION SURFACE MEULÉE SOUDÉE MACHINÉE MIRENAILLÉE MÉTAL PROPRE
 TEMPÉRATURE SURFACE < -4°C/20°F -4°C/20°F à 10°C/50°F 10°C/50°F à 52°C/125°F > 52°C/125°F

RÉSULTATS MÉTRIQUE IMPÉRIALE

ITEM	COMMENTAIRES	ACCEPTÉ	REJETÉ
1	ID 79701 item D3011-1 (x3)	✓	
2	ID 80049 item D206-667-2078L	✓	
3	ID 78574 item D412-664-203	✓	
4	ID 78573 item D412-664-203	✓	
5	ID 78575 item D412-664-203	✓	
6	ID 78576 item D412-664-203	✓	
7	ID 79115 item D212-664-107	✓	
8	ID 79116 item D212-664-107	✓	8/12/2012

NOTE: No indication found, at the moment of inspection on 411 pieces.

Étendue des Services

L'entente selon laquelle le Groupe Acuren Inc. Exécute les services ne concerne que les énoncés par écrit. En aucune circonstance ces services ne s'étendent au-delà de l'exécution des services demandés. Il est entendu que toutes les descriptions, les observations et les expressions d'opinions faites par Acuren reflètent les opinions ou les observations de l'entreprise fondées sur l'information et les hypothèses fournies par le propriétaire/opérateur, et elles ne constituent pas des déclarations ou des garanties ou ne peuvent être interprétées comme constituant. Le Groupe Acuren Inc. N'assume aucune des responsabilités du propriétaire/opérateur, et le propriétaire/opérateur conserve la responsabilité entière des décisions prises en matière d'ingénierie, de fabrication, de réparation et d'usage à partir de l'information ou des données fournies par Acuren en rapport avec les services décrits dans les présentes ne peuvent excéder le coût des services rendus.

Norme de Diligence

Dans l'exécution des services, le Groupe Acuren Inc. Applique le degré de diligence, le soin et la compétence normalement exercés dans des circonstances semblables par d'autres fournisseurs de ce type de services opérant dans la même localité ou dans une localité similaire. Aucune autre garantie, implicite ou explicite, n'est faite ou voulue par le Groupe Acuren Inc.

SIGNATURES

REPRÉSENTANT TECHNICIEN (SIGNATURE): <u>Andrew Sheldon</u> <u>Sheldon</u>	SIGNATURE <u>Al Sheldon</u>	FTJ#: <u>F003487</u>
NOM (MOULÉ): <u>DAVID REYN</u>	1 ^{er} TECHNICIEN	2 ^{me} TECHNICIEN
ONGC NIVEAU <u>2</u> SNT NIVEAU <u>2</u>	ONGC NIVEAU _____	SNT NIVEAU _____
ONGC N° REGISTRATION <u>11611</u>	ONGC N° REGISTRATION	INITIALES